

CLAIMS

What is claimed is:

- 1 1. (currently amended) An apparatus for use in a borehole in an earth formation
2 comprising:
 - 3 (a) a conducting tubular, said conducting tubular having a damping portion
4 for interrupting reducing a flow of eddy currents;
 - 5 (b) ~~a transmitter at least one transmitter positioned on a first side of said~~
6 ~~damping portion on said conducting tubular for propagating which~~
7 propagates an electromagnetic field in the earth formation;
 - 8 (c) ~~a receiver at least one receiver positioned on a second side opposite said~~
9 ~~first side of said damping portion axially separated from said transmitter~~
10 ~~for receiving~~ on said conducting tubular which receives a temporal signal
11 resulting from interaction of said electromagnetic field with said earth
12 formation; and
 - 13 (d) a processor for determining from said temporal signal a resistivity
14 of said earth formation.
- 15
1 2. (currently amended) The apparatus of claim 1, wherein said damping portion
2 further comprises at least one cut in said damping portion of said conducting
3 tubular.
4
- 1 3. (original) The apparatus of claim 2, wherein a non-conductive material is
2 disposed within said cut.

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1 4. (original) The apparatus of claim 1, wherein said damping portion further
2 comprises

3 (i) a first segment having a cut, and

4 (ii) a second segment with non-conductive material positioned on an outer
5 face of said segment.

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1 5. (original) The apparatus of claim 1, wherein said damping portion further
2 comprises a segment of pipe with a non-conductive material positioned on an
3 outer face of said segment.

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1 6. (currently amended) The apparatus of claim 1 wherein said ~~non-conductive~~
2 ~~material~~ damping portion comprises a ferrite.

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1 7. (currently amended) The apparatus of claim 1 wherein said ~~non-conductive~~
2 ~~material~~ damping portion comprises a material with low magnetostriction.

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1 8. (currently amended) The apparatus of claim 1, wherein said at least one
2 transmitter further comprises at least one coil oriented so as to induce a magnetic
3 moment in one of (i) a longitudinal parallel to an axis of said tubular, and, (ii) a
4 direction inclined to said longitudinal axis.

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1 9. (currently amended) The apparatus of claim 1, wherein said at least one receiver
2 further comprises at least one coil having an orientation selected from (i) parallel
3 to an axis of said tubular, and, (ii) inclined to an axis of said tubular.

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1 10. (currently amended) The apparatus of claim 2 wherein said cut is comprises a
2 longitudinal cut.

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1 11. (currently amended) The apparatus of claim 2 wherein said cut is comprises a
2 transverse cut.

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1 12. (original) The apparatus of claim 1 further comprising a device for extending said
2 borehole.

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1 13. (original) The apparatus of claim 1 wherein said processor further determines a
2 distance to a bed boundary in said earth formation.

3

1 14. (currently amended) A method of drilling an earth formation:

2 (a) conveying a bottom hole assembly (BHA) into said earth formation, said
3 BHA including a tubular having a damping portion for ~~interrupting~~
4 reducing a flow of eddy currents;

5 (b) using ~~a transmitter positioned on a first side of said damping portion at~~
6 least one transmitter on said tubular for producing an electromagnetic field
7 in the earth formation;

- 8 (c) using at least one receiver on said tubular ~~a receiver positioned on a~~
9 ~~second side opposite said first side of said damping portion axially~~
10 ~~separated from said transmitter~~ for receiving a temporal signal resulting
11 from interaction of said first signal with said earth formation; and
12 (d) determining from said temporal signal said resistivity of said earth
13 formation.

14

- 1 15. (original) The method of claim 14, wherein said damping portion further
2 comprises at least one cut.

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- 1 16. (original) The method of claim 15, wherein a non-conductive material is disposed
2 within said cut.

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- 1 17. (original) The method of claim 14, wherein said damping portion further
2 comprises

- 3 (i) a first segment having a cut, and
4 (ii) a second segment with non-conductive material positioned on an outer
5 face of said segment.

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- 1 18. (original) The method of claim 14, wherein said damping portion further
2 comprises a segment of pipe with a non-conductive material positioned on an
3 outer face of said segment.

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1 19. (original) The method of claim 18 further comprising using a ferrite for said non-
2 conductive material.

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1 20. (original) The method of claim 18 further comprising using a material with low
2 magnetostriction for said non-conductive material.

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1 21. (currently amended) The method of claim 14, wherein said at least one transmitter
2 further comprises at least one coil oriented so as to induce a magnetic moment in
3 one of (i) a longitudinal parallel to an axis of said tubular, and, (ii) a direction
4 inclined to said longitudinal axis.

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1 22. (currently amended) The method of claim 14, wherein said at least one receiver
2 further comprises at least one coil having an orientation selected from (i) parallel
3 to an axis of said tubular, and, (ii) inclined to an axis of said tubular.

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1 23. (currently amended) The method of claim 15 wherein said cut ~~is~~ comprises a
2 longitudinal cut.

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1 24. (currently amended) The method of claim 15 wherein said cut ~~is~~ comprises a
2 transverse cut.

3

1 25. (original) The method of claim 14 further comprising using a device on said BHA
2 for extending said borehole.

3

1 26. (original) The method of claim 14 further comprising determining a distance to an
2 interface in said earth formation.

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1 27. (original) The method of claim 25 wherein (a) – (d) are carried out during
2 continuing rotation of said BHA.

3

1 28. (original) The method of claim 26 further comprising using said determined
2 distance for controlling a drilling depth of said BHA.

3

1 29. (original) The method of claim 26 wherein said interface comprises a bed
2 boundary.

3

1 30. (original) The method of claim 26 wherein said interface comprises a fluid
2 interface.

3

1 31. (new) The apparatus of claim 1 wherein said at least one transmitter and said at
2 least one receiver are positioned on said conducting tubular on opposite sides of
3 said damping portion.

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1 32. (new) The method of claim 14 further comprising positioning said at least one
2 transmitter and said at least one receiver on opposite sides of said damping
3 portion.

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